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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,699	03/11/2005	Shu Kobayashi	050123	5316
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KRATZ, QUINTOS & HANSON, LLP			EXAMINER	
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WASHINGTON, DC 20005			ART UNIT	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/527,699	Applicant(s) KOBAYASHI ET AL.	
	Examiner Rip A. Lee	Art Unit 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☒ Claim(s) 8, 10, 11, 17, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

This office action follows a request for continued examination (RCE) under 37 § C.F.R. 1.114, filed on May 10, 2007. Claims 1-20 are pending.

#### *Claim Objections*

1. Claim 8 is objected to because of the following informalities:
  - (i) On page 6, line 1, delete opening parenthesis “ ( ” that appears before “wherein R<sup>2</sup>, R<sup>3</sup>, R<sup>5</sup> and R<sup>6</sup>”
  - (ii) On page 6, line 6, delete opening bracket “ [ ” that appears before “wherein R<sup>7</sup> and R<sup>8</sup>.”
  - (iii) On page 6, line 12, delete closing bracket and parenthesis “ ] ) ” that appear after “substituent.”
  - (iv) On page 7, line 1, delete opening parenthesis “ ( ” that appears before “wherein R<sup>10</sup>”
  - (v) On page 7, line 8, delete closing parenthesis “ ) ” that appears before “atoms”
  - (vi) On page 7, line 11, delete opening parenthesis “ ( ” that appears before “wherein R<sup>13</sup>”
  - (vii) On page 8, line 15, delete closing parenthesis “ ) ” that appears after “substituent”
  - (viii) On page 9, line 1, opening parenthesis “ ( ” that appears before “wherein R<sup>16</sup> and R<sup>17</sup>”
  - (ix) On page 9, line 8, delete closing parenthesis “ ) ” that appears after “substituent”
2. Claim 10 is objected to because of the following informalities: Please rewrite line 3 as “formulas [1], [2], [4], or [5], or monomers” since the claim provides for a selection. Appropriate correction is required
3. Claim 10 is objected to because of the following informalities: Please replace “is one having an aromatic ring” with “has an aromatic ring.” Appropriate correction is required.

4. Claim 11 is objected to because of the following informalities: Please replace “are those having” with “have”. Appropriate correction is required.
5. Claims 17, 19, and 20 are objected to because of the following informalities: A method claim is comprised of specific steps and needs to include at least one positive step (*i.e.*, includes at least one action verb). Currently, the claim provides a description, or characterization, of a process, but it does not set forth a process with active steps. Appropriate corrections are required.
6. Claim 19 is objected to because of the following informalities: Please rewrite the last phrase in passive voice (*i.e.*, “where the carboxyl ester position of the allyl carbonate is substituted with the carbon nucleophilic agent”) since the carbon nucleophilic agent is not substituting any particular material other than itself. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The subject matter of the claim is unclear. The chemical fragment described in the claim is not disclosed to the extent that one of skill in the art would be apprised of the scope of the claim. Elucidation of claim language and/or revision of the claim is required.
9. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The subject matter of the claim is unclear for it is not understood how monomer (3) is a copolymer. Elucidation of claim language and/or revision of the claim is required.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 1-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Králik *et al.* (*J. Mol. Catal. A*, 1995) and Corain *et al.* (*J. Mol. Catal. A*, 2001).

The prior art of Králik *et al.* and Corain *et al.* discloses preparation of catalysts comprising palladium supported on crosslinked polymer. Crosslinked polymer is treated with soluble palladium precursor such as  $\text{Pd}(\text{NH}_3)_4^{2+}$ . Subsequent reduction results in deposition of elemental palladium onto the support. As shown in Figure 8 of Králik *et al.*, the external surface of resin particles contains micrometer sized palladium crystallites. Figures 2 and 3 of Corain *et al.* reveal the presence of palladium nanoclusters distributed within the crosslinked polymer. In either case, palladium particles are physically carried on the crosslinked polymer.

While the method of preparation of catalyst in the prior art differs from that recited in the instant claims, the final product is essentially the same as that described in the claims, namely, a palladium catalyst physically carried on a crosslinked organic polymer compound. The instant claims are presented in product-by-process form. It is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different.<sup>1,2</sup> Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced.<sup>3</sup>

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<sup>1</sup> *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983).

<sup>2</sup> Since it is the patentability of a product claimed, and not of the recited process steps, which must be established, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable in cases where the prior art discloses a produce which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim. *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972). See also MPEP § 2113.

<sup>3</sup> *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

14. Claims 1-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Funaki *et al.* (U.S. 6,054,507).

Funaki *et al.* discloses a metal-organic polymer composite for use as catalyst composed of a microphase separated structure in which ultrafine metal (palladium) particles are contained in a "metalphilic" polymer phase of the microphase separated structure (abstract). Metal is located at the boundary of the polymer phase skeleton of the phase separated structure (col. 7, lines 48-50). In a preferred embodiment, structural stabilization is achieved by including monomer units having crosslinkable functional groups (col. 11, lines 12-25). The composite is prepared by dissolving polymer, metal particle precursor, and reducing agent in solvent, followed by heating the solution to reduce precursor to elemental metal particles (see claims and col. 8, line 64 – col. 9, line 16+). In this manner, palladium particles are physically carried on the crosslinked polymer.

While the method of preparation of catalyst in the prior art differs from that recited in the instant claims, the final product is essentially the same as that described in the claims, namely, a palladium catalyst physically carried on a crosslinked organic polymer compound. The instant claims are presented in product-by-process form. It is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different.<sup>1,2</sup> Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced.<sup>3</sup>

15. Claims 1-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tieke *et al.* (U.S. 5,045,436).

Tieke *et al.* teaches a composition containing a dibenzalacetone-palladium complex and at least on organic polymer (abstract). The composition is prepared by dissolving the palladium complex in the polymer (palladium complex is not copolymerizable with the polymer) followed by casting onto a substrate (claim 1). Polymers may be soluble in organic solvent and may be crosslinked, and in the case of the latter, the crosslinked polymer prepolymer must be soluble in organic solvent (col. 2, lines 63-68). Crosslinking is carried out after preparation of the

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palladium complex-prepolymer mixture (col. 3, lines 31-36). In this manner, palladium particles are physically carried on the crosslinked polymer. As such, the subject matter of the instant claims is anticipated by Tieke *et al.*

16. Claims 1-20 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kirk *et al.* (U.S. 6,743,873).

Kirk *et al.* discloses a polymerization catalyst system comprising at least one catalytic component, at least one activator component, and at least one epoxy functional porous organic polymer (claim 1). Example B shows preparation of DVB-crosslinked epoxy functional porous organic polymer containing units derived from glycidyl methacrylate. The support is amenable for use with a variety of olefin polymerization catalyst such as Brookhart (palladium) catalysts shown on page 9, lines 5-16.

While the method of preparation of catalyst in the prior art differs from that recited in the instant claims, the final product is essentially the same as that described in the claims, namely, a palladium catalyst physically carried on a crosslinked organic polymer compound. The instant claims are presented in product-by-process form. It is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different.<sup>1,2</sup> Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced.<sup>3</sup>

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.



17. Claims 1-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Toshima *et al.* (*Reactive Polymers*, 1991).

Toshima *et al.* discloses a hydrogenation catalyst immobilized on crosslinked polymer support. Metal (palladium) cluster particles are stabilized within trains of a protective polymer. The “loops” and “tails” of the protective polymer contain functional groups which react with a support, resulting in a covalently linked protective polymer containing a metal cluster therein; col. 1, page 139, see also Figure 2, example, page 138. While the method of preparation of catalyst in the prior art differs from that recited in the instant claims, the final product is essentially the same as that described in the claims, namely, a palladium catalyst physically carried on a crosslinked organic polymer compound. In this fashion, palladium particles are physically carried on the crosslinked polymer. While the method of preparation of catalyst in the prior art differs from that recited in the instant claims, the final product is essentially the same as that described in the claims, namely, a palladium catalyst physically carried on a crosslinked organic polymer compound. The instant claims are presented in product-by-process form. It is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different.<sup>1,2</sup> Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced.<sup>3</sup>

18. Claims 1-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Charmot *et al.* (U.S. 4,943,482).

Charmot *et al.* teaches metallized polymer particles comprising a crosslinked polymer and metal salt. Example 2 illustrates the nature of the invention. A solution of PdCl<sub>2</sub> is contacted with a crosslinked polymer derived from styrene, divinyl benzene, a 4-vinyl pyridine. Subsequent reduction with heating results in the deposition of metallic palladium on the surface of the polymer particle. In this manner, palladium particles are physically carried on the crosslinked polymer. While the method of preparation of catalyst in the prior art differs from that recited in the instant claims, the final product is essentially the same as that described in the claims, namely, a palladium catalyst physically carried on a crosslinked organic polymer

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compound. The instant claims are presented in product-by-process form. It is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different.<sup>1,2</sup> Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced.<sup>3</sup>

### *Response to Arguments*

19. Applicant's arguments filed May 10, 2007, have been carefully reviewed. The rejections of claims over Pittman *et al.* (U.S. 4,258,206) and Zoeller *et al.* (U.S. 6,452,043), set forth in the previous office action, have been withdrawn. As indicated by Applicant, the references do not teach a palladium catalyst that is physically carried on crosslinked polymer.

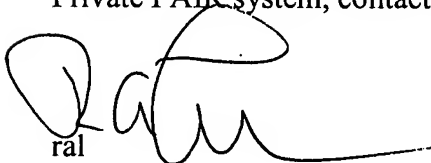
The rejections of claims over Králik *et al.*, Corain *et al.*, and Toshima *et al.* remain in force. Applicant submits these references teach chemical binding of palladium to crosslinked polymer. Apparently, Applicant equates this with the prior art of Pittman *et al.* or Zoeller *et al.*, in which discrete palladium metal complexes are covalently bound to functional groups on a polymeric support. As elucidated above, the prior art discloses contact of palladium (II) precursor with polymer support. While the precursor may be bound to the resin by covalent means, it appears that reduction results in deposition of macroscopic palladium crystallites on the external surface of resin particles. Corain *et al.* surmises that the electronically rich environment about the metal center has an effect on the observed enhancement in the hydrogenation rates, as illustrated in Figure 8. It must be appreciated that the drawing is a schematic that is not to scale, and it remains to be seen whether a macroscopic palladium particle is bound circumferentially to the polymer *via* dative bonding, as the drawing suggests. It is the examiner's position that the palladium particles of Králik *et al.* and Corain *et al.* are physically carried on the polymer. Regarding Toshima *et al.*, it is the protective polymer that is covalently bound to the support rather than the metal particles.

In light of this and previous discussion, the rejections of record have not been withdrawn.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).



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July 27, 2007